In re Patent Application of:
MORSE ET AL.
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In the Claims:

1.   (CURRENTLY AMENDED) An optical connector adapter for interfacing waveguide devices comprising:

a substrate for transporting optical signals and having opposing ends, a <u>substantially planar</u> top reference surface <u>formed as an optically flat polished surface, and including at least one of an implanted waveguide, deposited silica waveguide, and precision grooves at the top reference surface and defined by semiconductor masking,</u> and a <u>substantially planar</u> single <u>lithographically defined</u> side reference surface;

a carrier bracket received over the top reference surface at either end of the substrate, and including substrate alignment fiducials for aligning the top and side reference surfaces of the substrate relative to the carrier bracket; and

a substrate carrier that receives said substrate and carrier bracket and having carrier alignment fiducials for aligning the side reference surface and top reference surface of the substrate relative to the substrate carrier and carrier bracket for interfacing waveguide devices thereto.

2.   (ORIGINAL) An optical connector adapter according to Claim 1, wherein said substrate comprises a waveguide substrate having waveguides implanted within said top reference surface and defined by precision semiconductor masking.

3.   (ORIGINAL) An optical connector adapter according to Claim 1, wherein said substrate comprises a semiconductor waveguide substrate having silica waveguides deposited on said

top reference surface and defined by precision semiconductor masking.

4.   (ORIGINAL) An optical connector adapter according to Claim 1, wherein said substrate comprises a substrate holder having a plurality of precision grooves formed within said top reference surface and defined by semiconductor masking techniques.

5.   (ORIGINAL) An optical connector adapter according to Claim 4, wherein said substrate holder is formed from one of silicon or glass.

6.   (ORIGINAL) An optical connector adapter according to Claim 4, wherein said substrate holder comprises one of a molded silica resin composite or ceramic.

7.   (ORIGINAL) An optical connector adapter according to Claim 1, wherein said top reference surface comprises a precision polished, optically flat reference surface and said side reference surface comprises a lithographically defined and formed precision reference surface.

8.   (ORIGINAL) An optical connector adapter according to Claim 1, wherein said substrate comprises a molded substrate having precision molded top and side reference surfaces, and wherein said substrate alignment fiducials comprise alignment pins on which the top and side reference surfaces engage.

9.   (ORIGINAL) An optical connector adapter according
to Claim 8, wherein an alignment pin is set within each
carrier bracket such that an alignment pin is positioned
tangent to the top and side reference surfaces.

10.   (ORIGINAL) The optical connector adapter according
to Claim 1, and further comprising alignment pins positioned
within said carrier bracket for aligning a waveguide device
thereto.

11.   (CURRENTLY AMENDED) An optical connector adapter
for interfacing waveguide devices comprising:
     a substrate holder having opposing ends, a substantially
planar top reference surface formed as an optically flat
polished surface and a substantially planar single
lithographically defined side reference surface, said top
reference.surface having a plurality of grooves formed therein
for receiving optical fiber and spaced a predetermined
distance from the side reference surface;
     a carrier bracket received over the top reference surface
at either end of the substrate holder, and including substrate
alignment fiducials for aligning the top and side reference
surfaces of the substrate holder relative to the carrier
bracket; and
     a substrate carrier that receives said substrate holder
and carrier bracket and having carrier alignment fiducials for
aligning the side reference surface and top reference surface
of the substrate holder relative to the substrate carrier and
carrier bracket and aligning any optical fiber received within

the grooves on the top reference surface with waveguide devices.

12. (ORIGINAL) The optical connector adapter according to Claim 11, wherein said top reference surface comprises a precision polished, optically flat reference surface, and said side reference surface comprises a lithographically defined and formed precision surface.

13. (ORIGINAL) The optical connector adapter according to Claim 11, wherein said substrate comprises a molded substrate having precision molded top and side reference surfaces, and wherein said substrate alignment fiducials comprise alignment pins on which the top and side reference surfaces engage.

14. (ORIGINAL) The optical connector adapter according to Claim 13, wherein an alignment pin is set within each carrier bracket such that alignment pin is positioned tangent to the top and side reference surfaces.

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16. (ORIGINAL) The optical connector adapter according to Claim 11, wherein said plurality of grooves formed on the top surface are lithographically formed precision surfaces.

17. (ORIGINAL) The optical connector adapter according to Claim 11, wherein each carrier bracket is formed of a thermoset plastic.

18. (ORIGINAL) The optical connector adapter according to Claim 11, wherein said substrate carrier is formed of a thermoset plastic.

19. (ORIGINAL) The optical connector adapter according to Claim 11, wherein said side reference surface is orthogonal to the top reference surface.

20. (ORIGINAL) The optical connector adapter according to Claim 11, wherein said grooves are formed substantially parallel to each other.

21. (ORIGINAL) The optical connector adapter according to Claim 11, where substrate holder is substantially rectangular configured.

22. (ORIGINAL) The optical connector adapter according to Claim 11, wherein the grooves are dimensioned to receive single mode fiber with an optical core of less than about nine microns.

23. (ORIGINAL) The optical connector adapter according to Claim 11, wherein the grooves are dimensioned to receive multimode fiber.

24. (CURRENTLY AMENDED) A method of forming an optical connector adapter for interfacing waveguide devices comprising:

forming a substrate that transports optical signals and having opposing ends, a <u>substantially planar</u> top reference surface <u>formed as an optically flat polished surface, and including at least one of an implanted waveguide, deposited silica waveguide, and precision grooves at the top reference surface and defined by semiconductor masking,</u> and a <u>substantially planar</u> single <u>lithographically defined</u> side reference surface;

positioning a carrier bracket over the top reference surface at either end of the substrate and aligning the top and side reference surfaces of the substrate relative to the carrier bracket using alignment fiducials positioned on the carrier bracket; and

inserting the substrate having the carrier brackets thereon into a substrate carrier and aligning the top reference surface and single side reference surface relative thereto for interfacing with a waveguide device.

25. (ORIGINAL) A method according to Claim 24, and further comprising the step of forming the substrate as waveguide substrate having waveguides implanted within said top surface and defined by precision semiconductor masking.

26. (ORIGINAL) A method according to Claim 24, and further comprising the step of forming the substrate as a semiconductor waveguide substrate having silica waveguides deposited on said top surface and defined by precision semiconductor masking.

27. (ORIGINAL) A method according to Claim 24, and

further comprising the step of forming the substrate as substrate holder having a plurality of precision grooves formed within said top surface and defined by semiconductor masking techniques.

28. (ORIGINAL) A method according to Claim 24, and further comprising the step of aligning the carrier brackets on the top reference surface using alignment pins.

29. (CURRENTLY AMENDED) A method of forming an optical connector adapter for interfacing waveguide devices comprising the steps of:

forming a substrate ~~holder~~ having opposing ends, a substantially planar top reference surface formed as an optically flat, polished surface and having ~~with~~ grooves therein for receiving optical fiber, and a substantially planar single lithographically defined side reference surface, wherein the grooves are formed to be spaced a predetermined distance from the side reference surface;

positioning a carrier bracket over the top reference surface at each end and aligning the carrier bracket relative to the top and side reference surfaces of the substrate holder using alignment fiducials positioned on the carrier bracket; and

inserting the substrate holder having the carrier brackets positioned thereon into a substrate carrier and aligning the top reference surface and single side reference surface relative thereto for interfacing with a waveguide device.

30. (ORIGINAL) A method according to Claim 29, and further comprising the step of aligning the carrier brackets on the top surface using alignment pins.

31. (ORIGINAL) A method according to Claim 29, and further comprising the step of aligning the carrier bracket relative to the substrate holder using alignment pins.

32. (ORIGINAL) A method according to Claim 29, and further comprising the step of aligning each carrier bracket relative to the substrate holder using an alignment pin that is set within each carrier bracket such that an alignment pin is positioned tangent to top and side reference surfaces.